P-6.2 Explain how frequency and intensity affect the parts of the sonic spectrum.

Revised Taxonomy Levels   2.7 B   Explain conceptual knowledge

Physical science students did not address this concept

It is essential for all students to
  ➢ The range of audibility of the human ear depends upon the relative intensity of a sound in conjunction with the frequency of the sound.
  ➢ Relative intensity measurements (decibels)
      ◆ Compare the intensity of a particular sound to the intensity of a sound at the threshold of hearing (I_o)
      ◆ The relative intensity of sound is a logarithmic scale
      ◆ Relative intensity (measured in bels) $= \log I/I_o$
      ◆ Ten bels = one decibel $= 10 \log I/I_o$
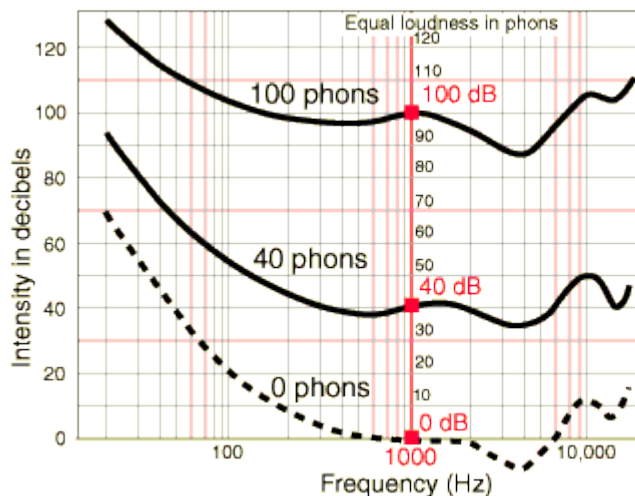
Example equal - loudness curves for the human ear.

a phon is a unit of subjective measure of loudness level. The level in phons is equal in number to the sound intensity of a 1,000-hertz reference sound, measured in decibels, judged to be the same loudness as the measured sound.

Assessment

The verb explain means that the major focus of assessment should be for students to "construct a cause and effect model". In this case, assessments will ensure that students can model how the combination of relative intensity and frequency affect the human perception of sound Because the indicator is written as conceptual knowledge, assessments should require that students understand the "interrelationships among the basic elements within a larger structure that enable them to function together." In this case, assessments must show that students can construct a cause and effect statement relating how the relative intensity of a sound and the frequency affect the human perception of sound.